

Trend Study 11B-16-05

Study site name: Steer Ridge.

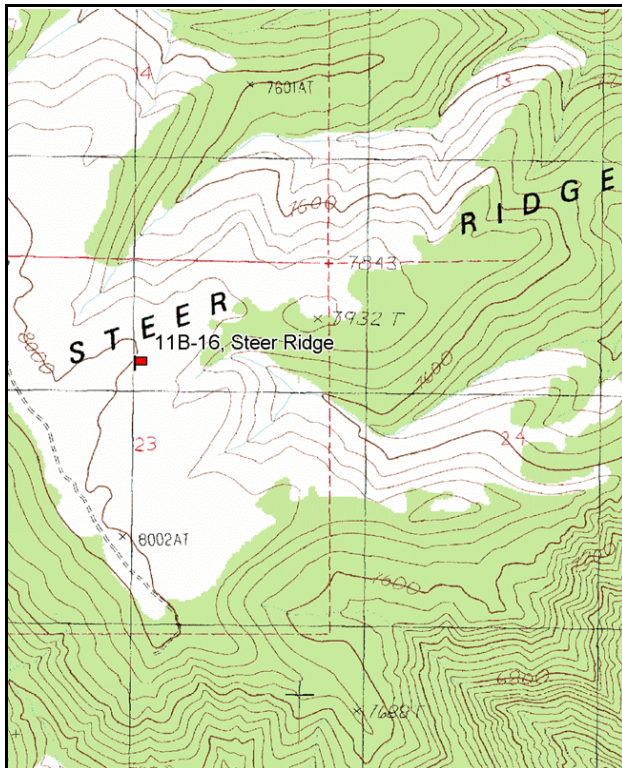
Vegetation type: Mountain Brush.

Compass bearing: frequency baseline 234 degrees magnetic.

Frequency belt placement: line 1 (11ft), line 2 (34ft), line 3 (59ft), line 4 (71ft), line 5 (95ft).

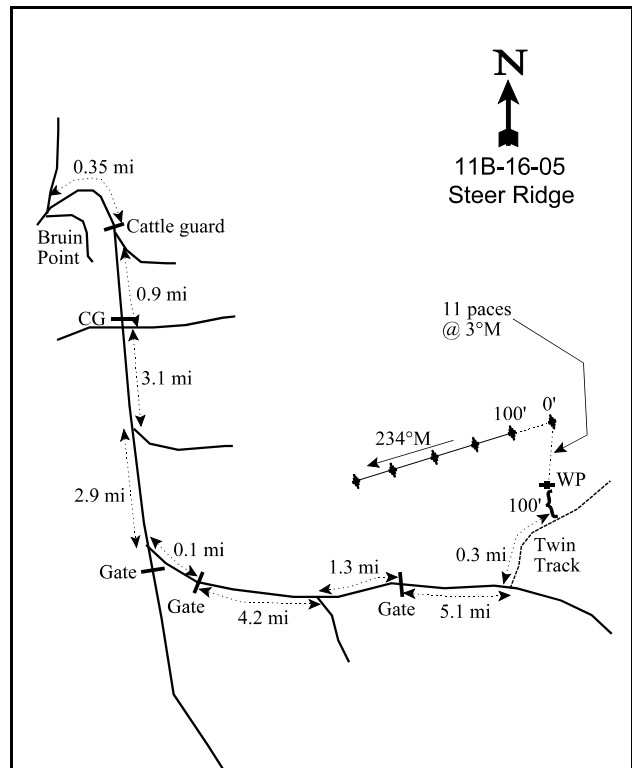
LOCATION DESCRIPTION

From Sunnyside, go up Water Canyon to the summit (Bruin Point). At the summit take the middle fork and go 0.35 miles. Stay right at the fork just beyond a cattle guard and go 0.9 miles. Go through an intersection beyond another cattle guard and go 3.1 miles to a fork. Stay right and travel another 2.9 miles to a fork and turn left just before a gate. Proceed 0.1 miles to a gate. Continue 4.2 miles to a fork. Stay left and continue an additional 1.3 miles to another gate. Continue 5.1 miles and turn left on a twin track road. Drive north 0.3 miles to a witness post 100 ft off the left side of the road. The 0 ft stake is 11 paces away at 3°M and is marked with browse tag number 32.



Map Name: Steer Ridge Canyon

Township 14S, Range 16E, Section 23



Diagrammatic Sketch

GPS: NAD 27, UTM 12S 4383080 N, 578008 E

DISCUSSION

Steer Ridge - Trend Study No. 11B-16

The Steer Ridge trend study was established in 1994. It samples a mountain shrub community near the end of the ridge just before it drops off into the Green River. Elevation is 8,000 feet and the site slopes slightly (8%) to the south. The mountain brush community type here is noticeably shorter in stature than that of the Twin Hollow (11B-15) study. The area is used heavily by wintering elk and deer. Deer are forced to move to lower elevations when snows get deeper, but elk are often seen in the area all winter. Pellet group data from 2000 was estimated at 82 elk and 19 deer use days/acre (203 edu/ha and 47 ddu/ha). In 2005, the estimated pellet group data was 76 elk and 13 deer use days/acre (188 edu/ha and 31 ddu/ha). There was also some light use by horses and cattle in 1994, although there has been no livestock use since. Multiple elk antler sheds were found on the site in 2000.

The soils on this site are moderately shallow and rocky with bed rock found at a depth of only 10 to 12 inches. Average effective rooting depth is estimated at just 10 inches. There appears to be enough cracks in the rock to allow deeper rooted shrubs like serviceberry, bitterbrush, and mountain big sagebrush to establish. The deepest soil readings occurred near the base of shrubs. Parent material is sandstone and the soil texture is a sandy clay loam with a neutral soil reaction (pH of 7.2). Phosphorus was measured at 5.5 ppm and values less than 6 ppm may limit normal plant growth and development in wildland soils (Tiedemann and Lopez 2004). The soil profile is rocky throughout with a relative surface rock and pavement cover of 9% in 1994, 15% in 2000, and 14% in 2005. Vegetation and litter cover are moderately low for a high elevation site. This suggests a lower site potential due to the more shallow soil than would normally be expected for a site at this elevation. In 2005, the soil was rated as stable by the erosion index assessment.

Key browse on this site consist of mountain big sagebrush and bitterbrush, which provided a combined cover between 10-18% in 1994, 2000, and 2005. Bitterbrush had mostly good vigor with a density of 1,120 plants/acre and only 9% classified as decadent in 2000. The growth form is short with an average of just over 2 feet in height with a crown diameter of 4.5 feet. Use was mostly light to moderate. In 2005, the density was 1,080 plants/acre with only 4% decadent and a similar growth form as in 2000, but utilization had increased to heavy (72%). Mountain big sagebrush has had a moderate density of 2,740 plants/acre, 2,160 in 2000, and 3,480 in 2005. The increase in density in 2005 came from a great increase of young plants (1,740/acre; 50% of population). Seedlings were also very abundant in 2005. Decadence was 13% in 1994, 22% in 2000, then 8% in 2005. Use has been mostly light to moderate. The more shallow soil and reduced site potential makes this area a more marginal site for mountain big sagebrush. Very high abundance of ants, associated with the presence of aphids, also appears to be effecting the vigor of some sagebrush plants.

There is also a small population of serviceberry which has provided less than 2% cover all years. These shrubs are more heavily utilized than sagebrush or bitterbrush. Individual serviceberry are small in stature due to the shallow, rocky soil and the heavy use. Average height for 1994, 2000, and 2005 is 34 inches, which allows most plants to be available to hedging. Other common shrubs include dwarf and mountain low rabbitbrush. There are also a few scattered rubber rabbitbrush, mountain mahogany, snowberry, and gray horsebrush.

The herbaceous understory is abundant and diverse. There are several co-dominant grass species, which include: thickspike, bluebunch wheatgrass, mutton bluegrass, Sandberg bluegrass, and needle-and-thread. This abundance of key grass species is advantageous for elk winter use. Forbs are diverse but they do not provide very much forage. In 1994 and 2000, perennial forb cover was less than 4%. In 2005, this had increased to 6%. Only 6 of the 31 species sampled in 2005 were annuals.

1994 APPARENT TREND ASSESSMENT

Soil trend for the site appears stable with good herbaceous vegetation cover (60% of the vegetation cover) which provides the best protection from high intensity summer storms. The trend for key browse would also appear stable with good age distributions, excellent vigor, and low rates of decadence which are not bad for the length and severity of the current drought. The herbaceous understory is also very good, with excellent production from more than five species of grasses. The forb component has many species (25), but only contributes 11% of the total vegetation cover. The Desirable Components Index score is good due to moderate browse cover, low browse decadence, and excellent perennial grass cover.

winter range condition (DC Index) - Good (69) Moderate Potential scale

2000 TREND ASSESSMENT

Trend for soil is stable. Herbaceous vegetation, which better protects the soil from high intensity storms, accounts for nearly 60% of the total vegetation cover. Trend for browse is down. Mountain big sagebrush and bitterbrush, the key browse species, both decreased in density. Sagebrush decreased from 2,740 to 2,160 plants/acre. Decadence increased from 13 to 22%. Bitterbrush density decreased from 1,400 to 1,120 plants/acre, while decadence remained unchanged. Strip frequency and cover of sagebrush increased, while bitterbrush changed little on both accounts. Use of these shrubs was light to moderate, vigor good, and percent decadence was low. Trend for the herbaceous understory is stable. Sum of nested frequency of perennial grasses declined slightly, but cover increased from 14% to almost 18%. Nested frequency of mutton bluegrass increased significantly while the less desirable Salina wildrye declined significantly. Prairie junegrass was abundant in 1994, but decreased significantly in 2000 as well. It appears that the extremely dry conditions this summer have contributed to this decline. Sum of nested frequency of perennial forbs also declined slightly with only two species, sego lily and desert parsley, declined significantly. Total cover of forbs is almost identical to 1994. The DCI score remained good, although browse cover increased some.

TREND ASSESSMENT

soil - stable (0)

browse - down (-2)

herbaceous understory - stable (0)

winter range condition (DC Index) - Good (74) Moderate Potential scale

2005 TREND ASSESSMENT

The trend for soil is stable. The ratio of protective ground cover (vegetation, litter and cryptogams) to bare ground remained relatively unchanged from 2000 to 2005. The trend for browse is up. The key browse species mountain big sagebrush density increased 38% from 2,160 plants/acre in 2000 to 3,480 plants/acre in 2005. The proportion of decadent individuals decreased from 22% to 8% and those classified as dying decreased from 7% to 3%. The recruitment of the site is very high with 50% of the population classified as young. This was an increase from 16% in 2000. There were also nearly 7,000 seedlings/acre on the site. The population of bitterbrush, also a key browse species on the site, remained stable from 2000 to 2005, despite an increase of use from light-moderate to heavy. The population decreased slightly from 1,120 plants/acre in 2000 to 1,080 plants/acre in 2005. The number of decadent individuals decreased from 9% to 4% and individuals classified as dying decreased from 2% to 0%. The trend for herbaceous understory is slightly down. The nested frequency of perennial grasses, very important for winter range, decreased by 11%. A significant increase in cheatgrass nested frequency and a substantial increase of cheatgrass cover negatively influenced the trend. In 2000, cheatgrass was identified in 1% of the quadrats, but in 26% of the quadrats in 2005. The nested frequency of perennial forbs also increased slightly, but not enough to stabilize the trend. The DCI score was excellent due to an increases in browse cover, recruitment, and perennial grass cover.

TREND ASSESSMENT

soil - stable (0)

browse - up (+2)

herbaceous understory - slightly down (-1)

winter range condition (DC Index) - Excellent (93) Moderate Potential scale

HERBACEOUS TRENDS --

Management unit 11B, Study no: 16

T y p e	Species	Nested Frequency			Average Cover %		
		'94	'00	'05	'94	'00	'05
G	Agropyron dasystachyum	_{ab} 146	_b 160	_a 108	1.61	3.76	2.34
G	Agropyron spicatum	151	147	131	4.19	4.91	3.67
G	Bouteloua gracilis	-	4	6	-	.18	.33
G	Bromus tectorum (a)	_a -	_a 1	_b 71	-	.00	.62
G	Carex sp.	-	-	2	-	-	.00
G	Elymus salina	_b 69	_a 25	_{ab} 42	2.32	.63	2.34
G	Koeleria cristata	_c 86	_a 5	_b 41	1.81	.03	.67
G	Oryzopsis hymenoides	_b 32	_a 9	_{ab} 19	.28	.19	.60
G	Poa fendleriana	_a 72	_b 187	_a 53	1.15	4.67	.76
G	Poa secunda	_a 27	_a 39	_b 57	.17	.24	1.02
G	Sitanion hystrix	1	1	-	.00	.03	-
G	Stipa comata	_a 67	_{ab} 78	_b 111	1.95	3.06	6.06
G	Stipa lettermani	_b 27	_a -	_{ab} 10	.72	.00	.07
Total for Annual Grasses		0	1	71	0	0.00	0.62
Total for Perennial Grasses		678	655	580	14.25	17.73	17.91
Total for Grasses		678	656	651	14.25	17.73	18.53
F	Agoseris glauca	12	6	9	.06	.05	.04
F	Allium sp.	-	-	3	-	-	.01
F	Antennaria rosea	14	8	8	.13	.15	.21
F	Arabis sp.	3	-	2	.00	-	.03
F	Arenaria fendleri	10	-	1	.18	-	.00
F	Astragalus convallarius	-	3	3	-	.00	.00
F	Aster sp.	-	5	-	-	.01	-
F	Astragalus sp.	3	7	-	.01	.34	-
F	Balsamorhiza sagittata	7	3	2	.86	.33	1.06
F	Castilleja flava	-	-	1	-	-	.00
F	Castilleja linariaefolia	_b 23	_b 22	_a -	.14	.12	-
F	Calochortus nuttallii	_b 17	_a -	_{ab} 7	.05	-	.02
F	Chenopodium fremontii (a)	1	-	6	.00	-	.06
F	Chenopodium leptophyllum(a)	5	-	4	.01	-	.01

Type	Species	Nested Frequency			Average Cover %		
		'94	'00	'05	'94	'00	'05
F	Comandra pallida	_a 4	_b 18	_{ab} 11	.03	.32	.36
F	Collinsia parviflora (a)	-	4	-	-	.01	-
F	Crepis acuminata	10	9	15	.07	.19	.16
F	Delphinium nuttallianum	_a -	_a -	_b 16	-	-	.05
F	Eriogonum alatum	13	9	7	.08	.09	.34
F	Erigeron eatonii	18	15	14	.16	.28	.16
F	Erigeron flagellaris	-	-	5	-	-	.21
F	Eriogonum umbellatum	23	14	19	.29	.08	.14
F	Gayophytum ramosissimum(a)	_a 2	_a 4	_b 25	.00	.01	.05
F	Hedysarum boreale	-	-	4	-	-	.45
F	Lappula occidentalis (a)	_a -	_a -	_b 58	-	-	.30
F	Linum lewisii	-	7	-	-	.02	-
F	Lithospermum ruderales	12	5	8	.19	.18	.40
F	Lomatium sp.	_b 33	_a 1	_b 20	.08	.00	.11
F	Machaeranthera canescens	-	-	1	-	-	.03
F	Oenothera sp.	-	3	1	-	.00	.00
F	Penstemon caespitosus	_b 10	_{ab} 2	_a -	.24	.04	-
F	Penstemon sp.	2	2	1	.01	.01	.01
F	Phlox longifolia	_a 58	_a 53	_b 70	.11	.32	1.22
F	Polygonum douglasii (a)	_b 45	_a 16	_c 302	.10	.03	2.26
F	Sphaeralcea coccinea	_b 78	_b 62	_a 43	.77	.67	.62
F	Taraxacum officinale	-	3	-	-	.03	-
F	Tragopogon dubius	_a -	_a -	_b 15	.00	-	.11
F	Trifolium sp.	_a -	_{ab} 6	_b 11	-	.01	.05
Total for Annual Forbs		53	24	395	0.12	0.05	2.69
Total for Perennial Forbs		350	263	297	3.50	3.29	5.89
Total for Forbs		403	287	692	3.63	3.34	8.59

Values with different subscript letters are significantly different at alpha = 0.10

BROWSE TRENDS --

Management unit 11B, Study no: 16

Type	Species	Strip Frequency			Average Cover %		
		'94	'00	'05	'94	'00	'05
B	Amelanchier utahensis	4	5	4	.03	1.19	1.75
B	Artemisia tridentata vaseyana	78	62	81	3.79	6.40	7.29
B	Chrysothamnus depressus	52	33	44	1.45	.74	1.27
B	Chrysothamnus viscidiflorus lanceolatus	16	15	12	.29	.18	.09
B	Gutierrezia sarothrae	3	1	6	.00	-	.00
B	Opuntia sp.	1	0	2	.00	-	.03
B	Purshia tridentata	43	41	42	6.48	6.65	10.98
B	Symphoricarpos oreophilus	2	2	1	.03	.00	.18
B	Tetradymia canescens	7	4	7	.03	.18	.18
Total for Browse		206	163	199	12.13	15.35	21.80

CANOPY COVER, LINE INTERCEPT --

Management unit 11B, Study no: 16

Species	Percent Cover '05
Amelanchier utahensis	.95
Artemisia tridentata vaseyana	8.78
Chrysothamnus depressus	.90
Chrysothamnus viscidiflorus lanceolatus	.20
Gutierrezia sarothrae	.06
Purshia tridentata	15.19
Tetradymia canescens	.25

KEY BROWSE ANNUAL LEADER GROWTH --

Management unit 11B, Study no: 16

Species	Average leader growth (in) '05
Amelanchier utahensis	5.2
Artemisia tridentata vaseyana	3.7
Purshia tridentata	4.2

BASIC COVER --

Management unit 11B, Study no: 16

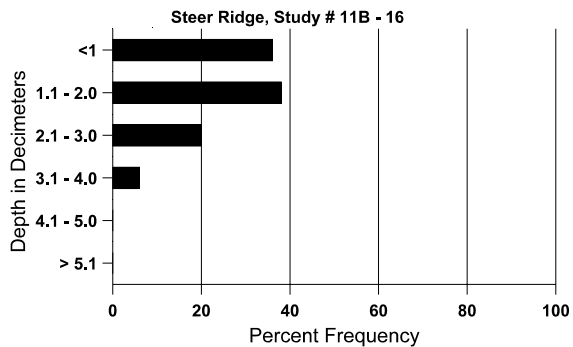
Cover Type	Average Cover %		
	'94	'00	'05
Vegetation	38.01	41.91	43.37
Rock	6.60	6.08	5.86
Pavement	2.01	9.07	8.09
Litter	20.10	46.68	31.25
Cryptogams	.06	.30	1.00
Bare Ground	20.32	18.44	25.35

SOIL ANALYSIS DATA --

Herd Unit 11B, Study # 16, Study Name: Steer Ridge

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	ppm P	ppm K	dS/m
10.8	66.8 (12.7)	7.2	52.0	25.4	22.6	3.3	5.5	176.0	0.7

Stoniness Index



PELLET GROUP DATA --

Management unit 11B, Study no: 16

Type	Quadrat Frequency		
	'94	'00	'05
Rabbit	7	7	9
Moose	-	-	3
Horse	1	-	-
Grouse	-	-	2
Elk	44	53	78
Deer	37	21	29
Cattle	2	-	-

Days use per acre (ha)	
'00	'05
-	-
-	-
-	-
-	-
82 (202)	76 (187)
20 (48)	13 (31)
-	-

BROWSE CHARACTERISTICS --
Management unit 11B, Study no: 16

		Age class distribution (plants per acre)					Utilization					
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% dying	% poor vigor	Average Height Crown (in)
Amelanchier utahensis												
94	100	-	40	60	-	-	20	0	-	-	0	30/42
00	160	-	20	140	-	-	50	0	-	-	25	31/46
05	80	-	-	80	-	-	0	100	-	-	0	41/65
Artemisia tridentata vaseyana												
94	2740	40	520	1860	360	460	18	4	13	2	2	19/26
00	2160	60	340	1340	480	200	26	2	22	7	8	17/26
05	3480	6980	1740	1460	280	320	16	8	8	3	3	23/29
Cercocarpus montanus												
94	0	-	-	-	-	-	0	0	-	-	0	38/38
00	0	-	-	-	-	-	0	0	-	-	0	37/44
05	0	-	-	-	-	-	0	0	-	-	0	43/53
Chrysothamnus depressus												
94	3440	-	-	3380	60	-	8	0	2	2	2	6/9
00	1780	-	100	1460	220	140	1	0	12	4	4	4/7
05	2260	380	120	2020	120	160	42	6	5	3	6	7/10
Chrysothamnus nauseosus hololeucus												
94	0	-	-	-	-	-	0	0	-	-	0	-/-
00	0	-	-	-	-	-	0	0	-	-	0	11/24
05	0	-	-	-	-	-	0	0	-	-	0	-/-
Chrysothamnus viscidiflorus lanceolatus												
94	500	-	20	480	-	-	4	0	0	-	0	10/12
00	460	-	-	440	20	20	0	0	4	-	0	10/10
05	380	-	40	320	20	-	53	11	5	5	5	12/16
Gutierrezia sarothrae												
94	60	-	-	60	-	-	0	0	0	-	0	6/8
00	20	-	-	-	20	-	0	0	100	-	0	4/7
05	160	-	-	160	-	-	0	0	0	-	0	8/12
Opuntia sp.												
94	20	-	-	20	-	-	0	0	-	-	0	-/-
00	0	-	-	-	-	-	0	0	-	-	0	3/23
05	40	-	-	40	-	-	0	0	-	-	0	5/18

		Age class distribution (plants per acre)					Utilization					
Y e a r	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% dying	% poor vigor	Average Height Crown (in)
<i>Purshia tridentata</i>												
94	1400	-	140	1120	140	40	31	3	10	-	0	20/51
00	1120	-	60	960	100	20	43	2	9	2	5	26/56
05	1080	-	20	1020	40	-	28	72	4	-	0	28/63
<i>Symphoricarpos oreophilus</i>												
94	60	-	-	60	-	-	0	0	-	-	0	20/41
00	40	-	-	40	-	-	0	0	-	-	0	15/29
05	20	-	-	20	-	-	0	0	-	-	0	23/48
<i>Tetradymia canescens</i>												
94	160	-	20	140	-	-	13	0	0	-	0	8/12
00	80	-	-	60	20	-	25	0	25	-	0	8/13
05	140	-	-	140	-	-	71	0	0	-	0	9/16